M72/2 processing log
Navigation data

a) Original data

The navigation data was extracted from the DSHIP data base on board of "RV Meteor". The original data is held on magnetic tapes as a backup of the DSHIP database. The data set contains 18 data files, each with the navigation of one day in a time interval of one or ten seconds. The data volume of the 1-second-interval data is 87 MB, the data volume of the 10-second-interval data is 10 MB. The Raw data are:

GPS position from TRIMBLE 4000 GPS
Speed from TRIMBLE 4000 GPS
Heading from Seatex MRU 5 motion reference unit
Depth from multibeam sonar systems

b) Processing

I. Processing steps:

1. Extraction of source data from DSHIP data base
2. Automatic filtering of erroneous positions
3. Visual control of navigation data

II. Processed data:

Result of the processing is the verified navigation, held in ASCII table (tab delimited) with the following format:

Column 1: Latitude [degree]
Column 2: Longitude [degree]
Column 3: Date [Format: DD.MM.YYYY HH:MM:SS]
Column 4: Flag
Column 5: Speed [knots]
Column 6: Heading [degree]
Column 7: Depth [metres]

The flag string consists of four digits with the following meaning:
Digit 1:
[0]: No position available
[1]: Position based on sensor CNAV-GPS
[2]: Position based on sensor TRIMBLE-GPS
Digit 2:
[0]: Position is not pitch corrected
[1]: Position is pitch corrected
Digit 3:
[0]: Position is not roll corrected
[1]: Position is roll corrected
Digit 4:
[0]: Centering is based on heading from GPS data (less accurate)
[1]: Centering is based on heading from Motion-Reference-Unit

III. Statistic
Data volume 1-second-interval data: 87 MB
Data volume 10-second-interval data: 9.4 MB
First data: 23.02.2007 06:00:00
Last data: 12.03.2007 23:59:50

Total number of positions after processing: 1527638
Total number of invalid GPS data: 5961 (0.39 percent)

M72/2 processing log
Multibeam echosounder data (EM120 & EM710)

a) Original data

The original data is held on hard drive on the data recording computer on board of "RV Meteor". There are some changes of the file name of the original raw data file: the prefacing line number (four digits) was deleted, the sensor name (EM120 or EM710) was added. The data was recorded using the Konsberg SIS software, the time period of each raw data file is less than 1 hour, mostly 30 minutes.

Data from the following sensors are included in the multibeam raw data:

> Bathymetry data: Kongsberg EM120/EM710
> Position (GGA): Simrad HS 50 GPS (til 06.03.2007) or CNAV DGPS (from 06.03.2007)
> Heading: Seatex MRU 5 motion reference unit
> Speed (VTG): Simrad HS 50 GPS
> Heave/Pitch/Roll: Seatex MRU 5 motion reference unit
> Sound velocity water column: SVProbe sound velocity profiler
> Sound velocity at transducer: SVProbe sound velocity profiler and sound velocity sensor
> Time (ZDA): Trimble 4000 GPS
> PPS: Ashtech GG24 Glonass

The data set contains 232 raw data files of the sonar system EM120 (approx. 3.2 GB in compressed state) and 142 raw data files of the sonar system EM710 (approx. 5.7 GB in compressed state). Compressing the data reduces the data volume approx. to half of the size. Several data gaps are caused by echosounder shutdowns during acoustic under water positioning work with the Posidonia system (e. g. for ROV dives or gravity cores) and water depths greater than the echosounders' maximum depth (EM710).

b) Processing

No data cleaning or data processing was done.

c) Data visualization

The GMT (Generic Mapping Tool) program version 4.1.4 was used to automatically create maps of the multibeam data. This process was automatised with the help of an unpublished perl script. To export ASCII data (position and depth) from the raw multibeam data an unpublished program, based on the Kongsberg data format description, was used. The multibeam data was not arranged to sets but every single data file was maped seperately, because it is helpful to see the content of every particular file. The format of the maps is the PNG (Portable Network Graphic) format, see one example in Fig. 1. For naming the maps the same name as the raw data was used but with a different file name extension.
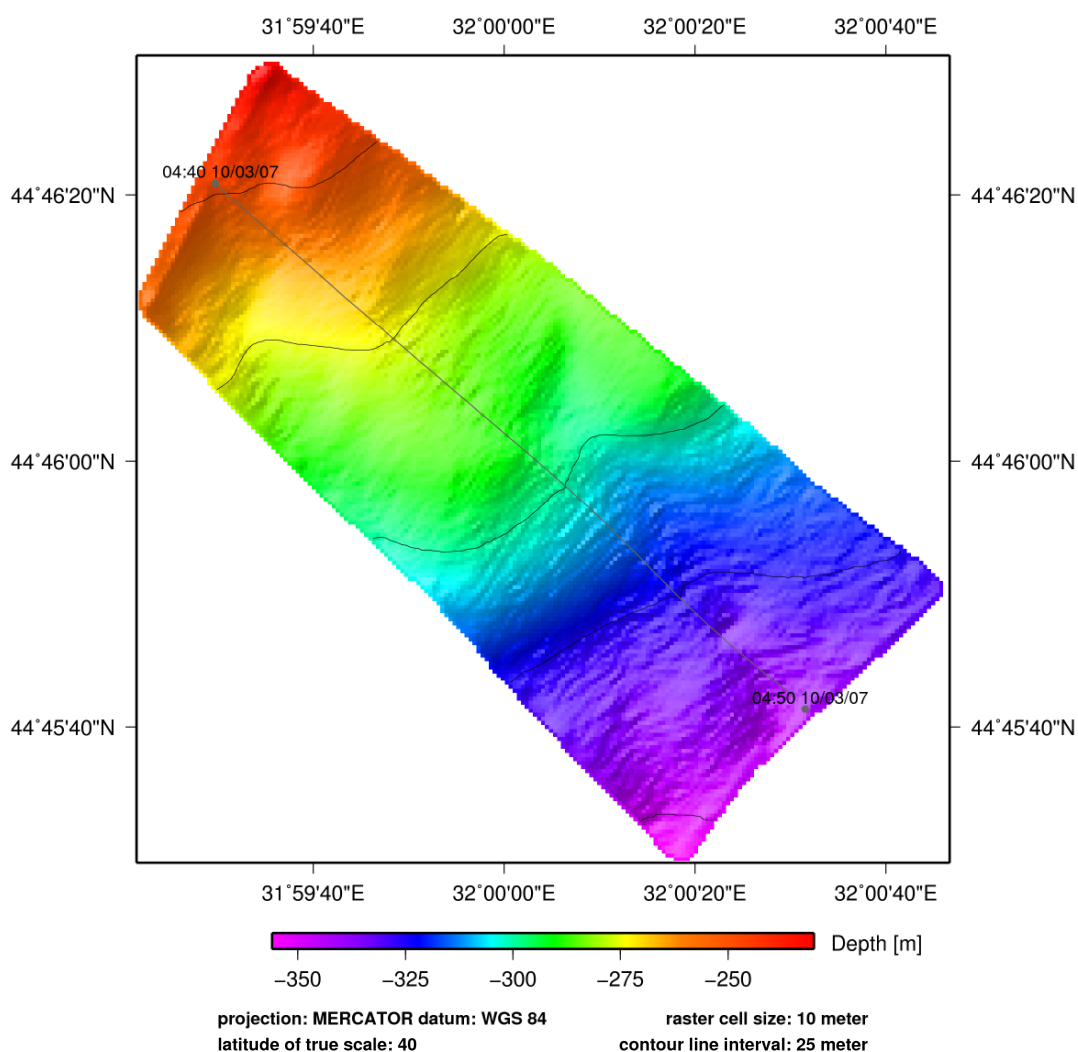
Swath Sonar Bathymetry Map
– Cruise M72/2 –

published by A. Boetius, Max Planck Institute for Marine Microbiology, Bremen, Germany
published at PANGAEA data base: www.pangaea.de

data sources

survey platform:	**R. V. METEOR**
sonar system:	**Kongsberg EM710**
data set name:	**20070310_044017_Meteor_EM710.xyz**
data set info:	**length: 1.0 nm, time: 0.2 h, speed: 5.8 kn**

projection: MERCATOR datum: WGS 84   **raster cell size: 10 meter**
latitude of true scale: 40   **contour line interval: 25 meter**

This map was automacitally generated using the generic mapping tool GMT
Be aware that the shown data set may contain outliers and navigation errors

Figure 1: Example of a map of a multibeam raw data file (EM120).